IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended). A transmission ~~Transmission~~ method, ~~for transmitting a plurality of symbols~~ comprising:

transmitting a plurality of symbols from a base station of a MC-CDMA telecommunication system to a plurality (K) of users, said base station including a plurality (M) of antenna elements;

spreading each symbol (d_k) to be transmitted to ~~a user~~ the plurality of users ~~being spread~~ with a coding sequence ($c_k(l)$) over a plurality (L) of carriers (l) to produce a plurality of corresponding frequency components; and~~, said base station being provided with a plurality (M) of antenna elements,~~

weighting, at the base station, ~~characterised in that~~ each frequency component produced by a symbol of a user (k) ~~is weighted~~ by a plurality (M) of weighting complex coefficients ($w_k^*(l,m),m=1,\ldots,M$) to obtain a plurality (LM) of weighted frequency components (z_k^m (l)), each weighting coefficient being relative to a user (k), a carrier (l) and an antenna element (m), ~~and~~ said plurality of weighting coefficients being determined from estimates of ~~the~~ channel coefficients ($h_k(l,m)$) of ~~the~~ downlink transmission channels between each antenna element and each user for each carrier frequency.

Claim 2 (Currently Amended): ~~Transmission~~ The transmission method according to claim 1, ~~characterised in that,~~ further comprising:

adding up per carrier, for each antenna element (m), the weighted frequency components relative to said antenna element and to the ~~different~~ plurality of users; ~~are added up per carrier to output~~

outputting a plurality (L) of compound frequency components $\left(\sum_{k=1}^{k} z_{kz}^{m}(\ell), \ell = 1,..,L\right)$;

and [[,]]

inverse Fourier transforming said plurality of compound frequency components ~~being further subjected to an inverse Fourier transform~~ to generate a signal ($S^m(t)$) to be transmitted by said antenna element.

Claim 3 (Currently Amended): ~~Transmission~~ The transmission method according to ~~claim~~ claims 1 or 2, ~~characterised in that~~ wherein said estimates of the channel coefficients are obtained as estimates of the channel coefficients of ~~the~~ uplink transmission channels between each user and each antenna element for each carrier frequency.

Claim 4 (Currently Amended): ~~Transmission~~ The transmission method according to claim 3, ~~characterised in that~~ further comprising:

obtaining the weighting coefficients relative to a given user ~~are obtained~~ as a function of ~~the~~ coding sequences of all said users, said estimates of channel coefficients, ~~the~~ transmit powers (Pt_k) used for respectively transmitting said symbols to the different users, a variance of noise (σ^2) affecting the received frequency components at the user side and ~~equalising~~ equalizing coefficients applied ~~thereto~~ to the weighting coefficients.

Claim 5 (Currently Amended): ~~Transmission method according to claim 4 characterised in that~~ A transmission method, comprising:

transmitting a plurality of symbols from a base station of a MC-CDMA telecommunication system to a plurality (K) of users, said base station including a plurality (M) of antenna elements;

spreading each symbol (d_k) to be transmitted to the plurality of users with a coding sequence ($c_k(l)$) over a plurality (L) of carriers (l) to produce a plurality of corresponding frequency components; and

weighting each frequency component produced by a symbol of a user (k) by a plurality (M) of weighting complex coefficients ($w_k^*(l,m), m=1, \ldots, M$) to obtain a plurality (LM) of weighted frequency components (z_k^m (l)), each weighting coefficient being relative to a user (k), a carrier (l) and an antenna element (m), said plurality of weighting coefficients being determined from estimates of channel coefficients ($h_k(l,m)$) of downlink transmission channels between each antenna element and each user for each carrier frequency,

wherein said estimates of the channel coefficients are obtained as estimates of the channel coefficients of uplink transmission channels between each user and each antenna element for each carrier frequency;

obtaining the weighting coefficients relative to a given user as a function of coding sequences of all said users, said estimates of channel coefficients, transmit powers (Pt_k) used for respectively transmitting said symbols to the different users, a variance of noise (σ^2) affecting received frequency components at a user side and equalizing coefficients applied to the weighting coefficients, wherein

the weighting coefficients relative to a given user g are determined from ~~the~~ elements of a vector w_g^*, where [[.*]] * denotes ~~the~~ a conjugate operation and where w_g is determined according to an expression of~~ the type~~:

$$\cancel{w_g = \mu g\,(\hat{\Phi}_g + \sigma^2 . I_{ML})^{-1} \left(\tilde{c}_g \circ \tilde{q}_g \circ \hat{h}_g \circ \tilde{c}_g\right)}$$

$$w_g = \mu g\,(\hat{\Phi}_g + \sigma^2 \bullet I_{ML})^{-1} \left(\tilde{c}_g \circ \tilde{q}_g \circ \hat{h}_g \circ \tilde{c}_g\right)$$

where, M and L ~~being~~ are respectively ~~the~~ a number of the antenna elements and ~~the~~ a number of the carriers;

$\tilde{c}_g$ is a vector of size ~~$M.L$~~ $\underline{M \bullet L}$ defined as ~~the~~ a concatenation of M times ~~the~~ a vector $c_g = (c_g(1),..,c_g(L))^T$ representing ~~the~~ a coding sequence of said given user g;

$\tilde{q}_g$ is a vector of size ~~$M.L$~~ $\underline{M \bullet L}$ defined as the concatenation of M times ~~the~~ a vector $q_g = (q_g(1),..,q_g(L))^T$ representing ~~the equalising~~ equalizing coefficients for said given user g;

$\hat{h}_g$ is a vector of size ~~$M.L$~~ $\underline{M \bullet L}$, ~~the~~ first L elements of which represent ~~the said~~ estimates of ~~the~~ a channel between antenna element 1 and user g, ~~the~~ second L elements of which ~~corresponding~~ correspond to ~~the~~ estimates of a channel between antenna element 2 and user g and so on;

μ_g is a scalar coefficient given by ~~the~~ a constraint upon ~~the~~ a transmit power for user g;

I_{ML} is ~~the~~ an identity matrix of size ~~$M.L$ x $M.L$~~ $\underline{M \bullet L}$ x $\underline{M \bullet L}$;

σ^2 is ~~the~~ a value of said noise variance;

$\hat{\Phi}_g$ is a hermitian matrix characterising ~~the~~ multiple access interference generated by the user g on ~~the~~ other users; and

~~where .∘.~~ $\underline{\circ}$ denotes ~~the~~ element by element multiplication of two vectors.

Claim 6 (Currently Amended): ~~Transmission~~ The transmission method according to claim 5, wherein ~~characterised in that~~ said hermitian matrix is obtained from an expression of ~~the type~~:

$$\cancel{\hat{\Phi}_g = \sum_{k \neq g}^{k} Pt_k . \hat{v}_{kg} \hat{v}_{kg}^H}$$

$$\underline{\hat{\Phi}_g = \sum_{k \neq g}^{k} Pt_k \bullet \hat{v}_{kg} \hat{v}_{kg}^H}$$

where K is number of users, Pt_k is ~~the~~ a transmit power for user k and

$$\hat{v}_{kg} = \tilde{c}_k^* \circ \tilde{q}_k \circ \hat{h}_k \circ \tilde{c}_g$$

where $\tilde{c}_k$ is a vector of size ~~$M.L$~~ $M \bullet L$ defined as ~~the~~ a concatenation of M times ~~the~~ a vector $c_k = (c_k(1),..,c_k(L))^T$ representing ~~the~~ a coding sequence of user k;

$\tilde{q}_k$ is a vector of size ~~$M.L$~~ $M \bullet L$ defined as ~~the~~ a concatenation of M times ~~the~~ a vector $q_k = (q_k(1),..,q_k(L))^T$ representing ~~the equalising~~ equalizing coefficients for user k; and[[.]]

$\hat{h}_k$ is a vector of size ~~$M.L$~~ $M \bullet L$, ~~the~~ first L elements of which represent ~~the said~~ estimates of ~~the~~ a channel between antenna element 1 and user k, ~~the~~ second L elements of which ~~corresponding~~ correspond to ~~the~~ estimates of a channel between antenna element 2 and user k and so on.

Claim 7 (Currently Amended): ~~Transmission method according to claim 4 characterised in that~~ A transmission method, comprising:

transmitting a plurality of symbols from a base station of a MC-CDMA telecommunication system to a plurality (K) of users, said base station including a plurality (M) of antenna elements;

spreading each symbol (d_k) to be transmitted to the plurality of users with a coding sequence ($c_k(l)$) over a plurality (L) of carriers (l) to produce a plurality of corresponding frequency components; and

weighting each frequency component produced by a symbol of a user (k) by a plurality (M) of weighting complex coefficients ($w_k*(l,m),m=1, . . . ,M$) to obtain a plurality (LM) of weighted frequency components (z_k^m (l)), each weighting coefficient being relative to a user (k), a carrier (l) and an antenna element (m), said plurality of weighting coefficients

being determined from estimates of channel coefficients ($h_k(l,m)$) of downlink transmission channels between each antenna element and each user for each carrier frequency,

wherein said estimates of the channel coefficients are obtained as estimates of the channel coefficients of uplink transmission channels between each user and each antenna element for each carrier frequency;

obtaining the weighting coefficients relative to a given user as a function of coding sequences of all said users, said estimates of channel coefficients, transmit powers (Pt_k) used for respectively transmitting said symbols to the different users, a variance of noise (σ^2) affecting received frequency components at a user side and equalizing coefficients applied to the weighting coefficients, wherein

the weighting coefficients relative to a given user g are determined from ~~the~~ elements of a vector w_g^* where [[.*]] * denotes ~~the~~ a conjugate operation and where w_g is determined according to an expression of ~~the type~~:

$$w_g = \mu_g\left(\hat{\Phi}_g + \sigma^2.I_{ML}\right)^{-1}(\tilde{c}_g \circ \hat{h}_g \circ \tilde{c}_g)$$

where, M and L ~~being~~ are respectively ~~the~~ a number of the antenna elements and ~~the~~ a number of the carriers;

$\tilde{c}_g$ is a vector of size ~~$M.L$~~ $M \bullet L$ defined as ~~the~~ a concatenation of M times ~~the~~ a vector $c_g\left(c_g(1),..,c_g(L)\right)^T$ representing ~~the~~ a coding sequence of said given user g;

$\hat{h}_g$ is a vector of size ~~$M.L$~~ $M \bullet L$, ~~the~~ first L elements of which represent ~~the said~~ estimates of ~~the~~ a channel between antenna element 1 and user g, ~~the~~ second L elements of which ~~corresponding~~ correspond to ~~the~~ estimates of a channel between antenna element 2 and user g and so on;

μ_g is a scalar coefficient given by ~~the~~ a constraint upon ~~the~~ a transmit power for user g;

I_{ML} is ~~the~~ an identity matrix of size ~~$M.L$ x $M.L$~~ $M{\bullet}L$ x $M{\bullet}L$;

σ^2 is ~~the~~ a value of said noise variance;

$\widehat{\Phi}_g$ is a hermitian matrix ~~characterising the~~ characterizing a multiple access interference generated by user g on ~~the~~ other users; and

~~where .$\circ$.~~ $\circ$ denotes ~~the~~ element by element multiplication of two vectors.

Claim 8 (Original): ~~Transmission method according to claim 4 characterised in that~~ A transmission method, comprising:

transmitting a plurality of symbols from a base station of a MC-CDMA telecommunication system to a plurality (K) of users, said base station including a plurality (M) of antenna elements;

spreading each symbol (d_k) to be transmitted to the plurality of users with a coding sequence ($c_k(l)$) over a plurality (L) of carriers (l) to produce a plurality of corresponding frequency components; and

weighting each frequency component produced by a symbol of a user (k) by a plurality (M) of weighting complex coefficients ($w_k^*(l,m),m=1, \ldots ,M$) to obtain a plurality (LM) of weighted frequency components (z_k^m (l)), each weighting coefficient being relative to a user (k), a carrier (l) and an antenna element (m), said plurality of weighting coefficients being determined from estimates of channel coefficients ($h_k(l,m)$) of downlink transmission channels between each antenna element and each user for each carrier frequency,

wherein said estimates of the channel coefficients are obtained as estimates of the channel coefficients of uplink transmission channels between each user and each antenna element for each carrier frequency;

obtaining the weighting coefficients relative to a given user as a function of coding sequences of all said users, said estimates of channel coefficients, transmit powers (Pt_k) used

for respectively transmitting said symbols to the different users, a variance of noise (σ^2) affecting received frequency components at a user side and equalizing coefficients applied to the weighting coefficients, wherein

the weighting coefficients relative to a given user g are determined from ~~the~~ elements of a vector w_g^* where [[.*]] * denotes ~~the~~ a conjugate operation and ~~where~~ w_g is determined according to an expression of ~~the type~~:

$$\cancel{w_g = \mu_g\left(\hat{\Phi}_g + \sigma^2.I_{ML}\right)^{-1}\hat{h}_g}$$

$$w_g = \mu_g\left(\hat{\Phi}_g + \sigma^2 \bullet I_{ML}\right)^{-1}\hat{h}_g$$

where, M and L ~~being~~ are respectively ~~the~~ a number of the antenna elements and ~~the~~ a number of the carriers;

$\hat{h}_g$ is a vector of size ~~*M.L*~~ *M•L*, ~~the~~ first *L* elements of which represent ~~the said~~ estimates of ~~the~~ a channel between antenna element 1 and user g, ~~the~~ second *L* elements of which corresponding to ~~the~~ estimates of a channel between antenna element 2 and user g and so on;

μ_g is a scalar coefficient given by ~~the~~ a constraint upon ~~the~~ a transmit power for user g;

I_{ML} is ~~the~~ an identity matrix of size ~~*M.L x M.L*~~ *M•L* x *M•L*;

σ^2 is ~~the~~ a value of said noise variance; and

$\hat{\Phi}_g$ is a hermitian matrix ~~characterising~~ ~~the~~ characterizing multiple access interference generated by user g on ~~the~~ other users.

Claim 9 (Currently Amended): ~~Transmission~~ The transmission method according to ~~claim~~ claims 7 or 8, ~~characterised in that~~ wherein said hermitian matrix is obtained from an expression of ~~the type~~:

$$\cancel{\hat{\Phi}_g = \sum_{k \neq g}^{k} Pt_k \cdot \hat{v}_{kg} \hat{v}_{kg}^H}$$

$$\underline{\hat{\Phi}_g = \sum_{k \neq g}^{k} Pt_k \bullet \hat{v}_{kg} \hat{v}_{kg}^H}$$

where K is number of users, Pt_k is ~~the~~ a transmit power for user k and

$$\hat{v}_{kg} = \tilde{c}_k^* \circ \hat{h}_k \circ \tilde{c}_g$$

where $\tilde{c}_k$ is a vector of size ~~*M.L*~~ *M•L* defined as ~~the~~ a concatenation of *M* times ~~the~~ a vector $c_k = (c_k(1),..,c_k(L))^T$ representing ~~the~~ a coding sequence of user *k*,

$\tilde{c}_g$ is a vector of size ~~*M.L*~~ *M•L* defined as ~~the~~ a concatenation of *M* times ~~the~~ a vector $c_g = (c_g(1),..,c_g(L))^T$ representing ~~the~~ a coding sequence of said given user g;

$\hat{h}_k$ is a vector of size ~~*M.L*~~ *M•L*, ~~the~~ first *L* elements of which represent ~~the said~~ estimates of ~~the~~ a channel between antenna element 1 and user *k*, ~~the~~ second *L* elements of which ~~corresponding~~ correspond to ~~the~~ estimates of a channel between antenna element 2 and user *k* and so on; and

~~where .∘.~~ ∘ denotes the element by element multiplication of two vectors.